

WHAT IS CLAIMED IS:

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1. A method using an electronic circuit comprising:  
combining a radio frequency (RF) signal, its reference signal, and a third signal which  
has a predetermined frequency to provide a new signal, wherein the new signal's  
frequency is solely responsive to the predetermined frequency of the third signal  
and the new signal's phase is responsive to that of the RF signal.
  2. A method as described in claim 1 further comprising:  
generating the third signal using a crystal-stabilized oscillator.
  3. A method as described in claim 1 further comprising  
converting the RF signal and its reference signal to an intermediate frequency.
  4. A method as described in claim 1 further comprising  
converting the new signal to a signal selected from the group consisting of an audio,  
video, digital and analog signal.
  5. A method as described in claim 1 further comprising  
transmitting the RF signal using an electronic conductor selected from the group  
consisting of antenna and cable.
  6. A method using an electronic circuit to convert a radio frequency (RF) signal comprising  
combining the RF signal and another signal, which has a predetermined frequency, to  
provide at least one output signal;  
combining the output signal with the RF signal's reference signal to provide two new  
output signals;  
combining the two new output signals to provide a new signal whose frequency is  
solely responsive to the predetermined frequency and whose phase is responsive  
to that of the RF signal.
  7. A method as described in claim 6 further comprising  
generating the signal which has the predetermined frequency using a crystal-stabilized  
oscillator.

- 1 8. A method as described in claims 6 further comprising  
2 converting the RF signal and its reference signal into an intermediate frequency.
- 3 9. A method as described in claims 6 further comprising  
4 converting the new signal to a signal selected from the group consisting of an audio,  
5 video, digital and analog signal.
- 6 10. A method as described in claims 6 further comprising  
7 transmitting the RF signal using an electronic conductor selected from the group  
8 consisting of antenna and cable.
- 9 11. An apparatus comprising a signal source, three multipliers, two 90 degree phase shifters,  
10 and an adder for converting a radio frequency (RF) signal to a new signal whose  
11 frequency is solely  
12 responsive to a predetermined signal frequency provided by the signal source and  
13 whose phase is responsive to that of the RF signal.
- 14 12. An apparatus as described in claim 11 wherein  
15 the signal source is a crystal-stabilized oscillator.
- 16 13. An apparatus as described in claim 11 further comprising  
17 at least one power splitter.
- 18 14. An apparatus as described in claim 11 further comprising  
19 at least one signal amplifier.
- 20 15. An apparatus as described in claim 11 further comprising  
21 at least one automatic gain circuit.
- 22 16. An apparatus as described in claim 11 further comprising  
23 another apparatus for converting the RF signal to an intermediate frequency.
- 24 17. An apparatus as described in claim 11 further comprising at least one harmonic mixer and  
25 one local oscillator.

- 1 18. An apparatus as described in claim **11** further comprising  
2 a device for converting the new signal to a signal selected from the group consisting of  
3 an audio, video, digital and analog signal.
- 4 19. An apparatus for converting a radio frequency (RF) signal and its reference signal  
5 comprising  
6 a signal source for providing a signal with a predetermined frequency;  
7 a first multiplier for combining a signal responsive to the RF signal and another signal  
8 responsive to the signal generated by the signal source, and providing at least one  
9 output signal;  
10 a second multiplier for combining a signal responsive to the reference signal and  
11 another signal responsive to the output signal from the first multiplier, and  
12 providing an output signal;  
13 a first 90 degree phase shifter for receiving a signal responsive to the reference signal,  
14 and generating an output signal;  
15 a third multiplier for combining a signal responsive to the output signal from the first  
16 multiplier and a signal responsive to the output signal from the first 90 degree  
17 phase shifter, and providing an output signal;  
18 a second 90 degree phase shifter for receiving a signal responsive to a signal selected  
19 from the group consisting of the output signal from the second multiplier and the  
20 output signal from the third multiplier, and providing an output signal; and  
21 an adder for combining a signal responsive to the output signal from the second  
22 multiplier and another signal responsive to the output signal from the third  
23 multiplier, and providing a new signal.
- 24 20. An apparatus as described in claim **19** wherein  
25 the signal source is a crystal-stabilized oscillator.
- 26 21. An apparatus as described in claim **19** further comprising  
27 at least one power splitter.
- 28 22. An apparatus as described in claim **19** further comprising  
29 at least one signal amplifier.

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- 2 23. An apparatus as described in claim 19 further comprising
- 3 at least one automatic gaining circuit.
- 4 24. An apparatus as described in claim 19 further comprising
- 5 a device for converting the RF signal and its reference signal to an intermediate
- 6 frequency.
- 7 25. An apparatus as described in claim 19 further comprising
- 8 a device for converting the new signal to a signal selected from the group consisting of
- 9 an audio, video, digital and analog signal.
- 10 26. An apparatus for converting a radio frequency (RF) signal and its reference signal
- 11 comprising
- 12 a signal source for providing a signal with a predetermined frequency;
- 13 a first multiplier for combining a signal responsive to the RF signal and another signal
- 14 responsive to the signal generated by the signal source, and providing at least one
- 15 output signal;
- 16 a second multiplier for combining a signal responsive to the reference signal and
- 17 another signal responsive to the output signal from the first multiplier, and
- 18 providing an output signal;
- 19 a first 90 degree phase shifter for receiving a signal responsive to the output signal from
- 20 the first multiplier, and generating an output signal;
- 21 a third multiplier for combining a signal responsive to the reference signal and another
- 22 signal responsive to the output signal from the first 90 degree phase shifter, and
- 23 providing an output signal;
- 24 a second 90 degree phase shifter for receiving a signal responsive to a signal selected
- 25 from the group consisting of the output signal from the second multiplier and the
- 26 output signal from the third multiplier, and providing an output signal; and
- 27 an adder for combining a signal responsive to the output signal from the second
- 28 multiplier and another signal responsive to the output signal from the third
- 29 multiplier, and providing a new signal.

- 1 27. An apparatus as described in claim 26 wherein  
2 the signal source is a crystal-stabilized oscillator.
- 3 28. An apparatus as described in claim 26 further comprising  
4 at least one power splitter.
- 5 29. An apparatus as described in claim 26 further comprising  
6 at least one signal amplifier.
- 7 30. An apparatus as described in claim 26 further comprising  
8 at least one automatic gaining circuit.
- 9 31. An apparatus as described in claim 26 further comprising  
10 an apparatus for converting the RF signal and its reference signal to an intermediate  
11 frequency.
- 12 32. An apparatus as described in claim 26 further comprising  
13 a device for converting the new signal to a signal selected from the group consisting of  
14 an audio, video, digital and analog signal.

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